OPERATION POINTBLANK

A Tale of Bombers and Fighters

William R. Emerson
Assistant Professor of History
Yale University

THE HARMON MEMORIAL LECTURES
IN MILITARY HISTORY
NUMBER FOUR

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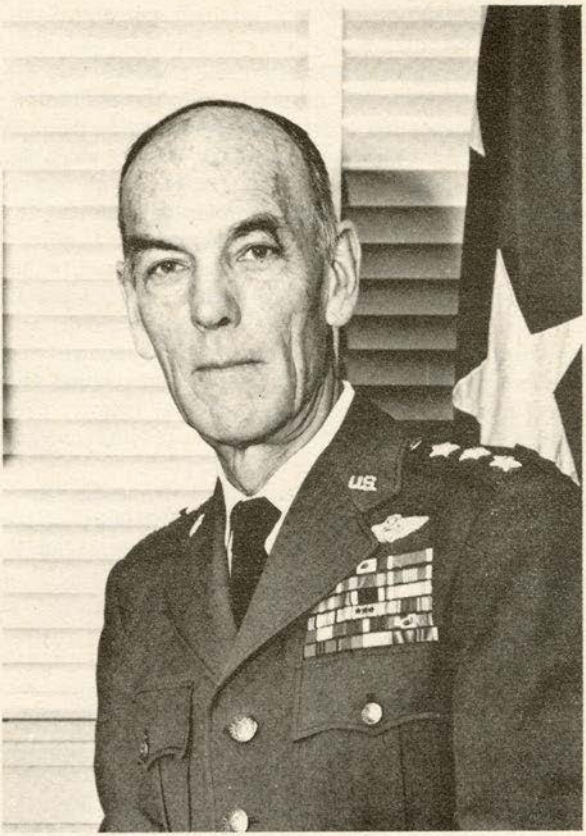

Lieutenant General
Hubert Reilly Harmon

FOREWORD

The Department of History of the United States Air Force Academy is the sponsor of this lecture series. The purpose of the series is twofold: to further the newly awakened interest in military history which has been evidenced throughout the United States and to stimulate our cadets toward developing a lifelong interest in this, their professional subject.

Each year a committee of nationally known civilian historians and Academy representatives selects an outstanding military historian to be the lecturer, who is then invited to present an original lecture on a subject of his choice within the field. In keeping with the purpose of the series, the Academy Library publishes the lecture and distributes it to leading scholars and libraries throughout this country.

These lectures are known collectively as the "Harmon Memorial Lecture Series," in memory of the accomplishments of the late Lieutenant General Hubert R. Harmon, the first Superintendent and "Father" of the Academy. General Harmon's personal interest in military history makes it particularly appropriate that he be honored in this way.

This, the fourth lecture in the series, was presented on 27 March 1962 to members of the Cadet Wing, members of the Faculty, and distinguished guests. The lecturer was Dr. William R. Emerson, Assistant Professor of History, Yale University.

Professor Emerson is qualified to give the Harmon Lecture on two grounds, since he is both a professional military historian and a former Air Force officer. During World War II he flew a combat tour of duty as a fighter pilot in P-47 Thunderbolts in the Mediterranean Theater. After the war he graduated from Yale University in 1948 and took his Ph.D. at Oxford University in 1951. He then returned to Yale, where he has taught European military history ever

since. He is a former Trustee of the American Military Institute and is presently serving as a member of the Advisory Committee to the Secretary of the Army on Military History. His published writings include *Monmouth's Rebellion,* published in 1952, *The Estates of the Petre Family in Essex, 1540-1640,* to be published this year, and a chapter on "F.D.R. (1941-1945)" in Ernest May, ed., *The Ultimate Decision,* published in 1960. Dr. Emerson is presently at work on a history of European war from the sixteenth century to the present.

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OPERATION POINTBLANK

A Tale of Bombers and Fighters

William R. Emerson

Yale University

> It has been a damned serious business. . . a damned nice thing--the nearest run thing you ever saw in your life. . .!
>
> The Duke of Wellington on Waterloo.

May I say what a pleasure it is for me as a former Air Force officer to be here at the Air Force Academy. All of us who have served in the Air Force look with pride on this Academy and on you the Cadets who make it up. To a greater degree than you perhaps realize, the Academy represents the crystallization of the hopes and trials, the accomplishments and even some of the shortcomings of the airmen who have gone before you. It stands in the line of a short tradition—as military traditions go—but a proud one, which it will soon be your obligation to carry forward into a future that no man can weigh or fully trace. Feeling this, I deem it a signal honor to have been invited here to deliver the 1962 Harmon Memorial Lecture, dedicated to the memory of the Academy's founder and first Superintendent.

I have chosen to discuss tonight one part of that Air Force tradition—American air strategy in Europe during the second World War. I want to concentrate, in particular, on an aspect of that strategy, Operation POINTBLANK, as it was called, the wartime code name for our strategic bombing offensive against the industrial potential of Germany in 1943 and 1944, and especially against the German Air Force. POINTBLANK was itself part and parcel of a larger Anglo-American air effort—the Combined Bomber Offen-

sive—which brought Germany under round-the-clock aerial bombardment by American heavy bombers by daylight and RAF Bomber Command by night. Unfortunately, time does not permit me to examine the massive and important contribution of the RAF's night bombers—the Halifaxes, the Wellingtons, the Lancasters, the Mosquitoes—to the air offensive. In our enthusiasm for the accomplishments of our own bombers, Americans have sometimes underestimated the achievements of Bomber Command. But I have not time to consider them. And I will content myself with noting that the recent appearance of the official history of Bomber Command—*The Strategic Air Offensive against Germany, 1939-1945*, by Sir Charles Webster and Noble Frankland—has set that record to rights. It was an impressive achievement; and it is an impressive history.

In the time which I have available, it is difficult enough to cover the American side of POINTBLANK in the detail which it deserves. I have called this lecture, perhaps frivolously, "Operation POINTBLANK: A Tale of Bombers and Fighters." If I had wished to be more frivolous still, I might, in the Victorian way, have appended another sub-title: "Don't Look Now—But Your Doctrine Is Showing." There would have been more than a germ of truth in it. POINTBLANK is one of the Air Force's great accomplishments, a famous victory. But it was very far from being a vindication of the Air Force's strategic doctrine. Indeed, because of shortcomings in that doctrine, POINTBLANK came within measurable distance of being a great defeat—even a disaster—for American arms. In this fact lies its continuing interest for the military historian. The weapons and tactics by which it was prosecuted are quite obsolete now, of course. Nevertheless, Operation POINTBLANK still holds some lessons for us for today and, I think, for tomorrow.

Now, POINTBLANK reached its high point—its low point, too—certainly, its crisis, on 14 October 1943. On that day the Eighth Air Force mounted Mission Number 115 against the Franconian city of Schweinfurt, the center of the German anti-friction bearings industry. Schweinfurt and the bearings industry were considered crucial targets for the bomber offensive. In January 1943, the combined British and American Chiefs of Staff had issued a general directive to the bomber commanders—the so-called Casablanca Directive—calling for "the progressive destruction and dislocation of the German military, industrial and economic system and the undermining of the morale of the German people to a point where their capacity for armed resistance is fatally weakened." Among the other target systems which the Directive set up, the German aircraft industry was given top priority. And since bearings played a crucial role in aircraft production, as well as in other sectors of the armament industry, the German bearings industry was given second priority. For a variety of reasons the bearings industry appeared to be vulnerable. It depended to some extent on the importation of Swedish steel which could be choked off. As a high precision industry, its destruction could, it was argued, set up a bottleneck in German armament production. Allied intelligence authorities had estimated that German reserves of bearings were so low that any disruption of the industry would have made its efforts felt immediately on aircraft production. Finally, the industry was highly concentrated geographically; 64% of German production was located in only four cities —Schweinfurt, Berlin-Erkner, Stuttgart, and Leipzig —and 42% of it was in Schweinfurt alone.[1]

The risks of hitting Schweinfurt were known to be great. The Eighth Air Force had attacked it for the first time in August 1943, along with the Messerschmitt fighter assembly plants at Regensburg on

the Danube, in the first of the deep penetration raids into Germany by American bomber forces. The losses then had been serious—60 heavy bombers shot down out of 376 dispatched, a loss rate of about 16%. Schweinfurt clearly was no "milk run." At such extreme range, moreover, it would be impossible to provide fighter escort for the bombers. Even with its newly devised auxiliary fuel tanks, the P-47 Thunderbolt, the main Eighth Air Force fighter during 1943, had a combat radius of action of just over 250 miles. Complicated arrangements with RAF Fighter Command permitted escort to be provided on the first stages of the raid by the short-range British Spitfires, with P-47s taking over and escorting the bombers inland from the Channel Coast. But P-47 range barely sufficed to take the fighters to the German border. The Thunderbolts would be forced to turn back somewhere around Aachen, just inside the German border. After that point, for about three hours, the bombers would be alone in the air over Germany, completely on their own.

The Eighth Air Force did not underestimate these risks. But the targets in Schweinfurt were adjudged to be so vital to the success of the Combined Bomber Offensive that the risks were accepted. This estimate of the importance and the vulnerability of the German bearings industry was unfortunately an incorrect one. The raids, though successful as far as bombing results went, had little effect on the German industrial machine. After the war, German experts estimated that even if the bearings industry had been wholly destroyed—and the raids fell far short of that—it could have been rebuilt absolutely from scratch in about four months' time.[2] But this was not known until after the United States Strategic Bombing Survey had examined the matter. On the basis of the available Allied intelligence in 1943, Schweinfurt appeared to be a target of first importance. Thus,

on 14 October, the 1st and 3rd Air Divisions of the Eighth Air Force were committed to the second of the great raids on Schweinfurt—sixteen bomber groups in all, 290 B-17s, and over 2900 aircrew members.

The results were catastrophic. The figures speak for themselves. Out of 291 bombers dispatched, 257 entered the German airspace. 60 were shot down, just over 20% of the number dispatched. 229 bombers reached Schweinfurt and dropped their bombs. 197 returned to England. After reaching England, five more bombers were abandoned or crashed upon landing. Seventeen others landed safely, but with such damage that they had to be written off entirely. The total number of B-17s lost, therefore, was 82 of 291, 28.2% of the force dispatched, 60 of them with all the crews. Moreover, of 175 bombers remaining, 142 had sustained damage to a greater or lesser degree. Only 33 bombers landed unscathed, about 12% of the force. It was a hecatomb.

Some of the bomber groups were lightly hit; three of them took no losses. With others, things went harder. The 94th Group lost six bombers out of twenty-one committed. The 92nd Group lost seven out of nineteen. The 306th Group lost ten out of eighteen. The 384th Group lost nine out of sixteen, and three more of its bombers crashed on returning to England, although their crews bailed out safely. Hardest hit was the 305th Group, which lost thirteen of its fifteen bombers which reached German airspace. The human casualties were equally heavy. Five complete aircrews were reported killed in action; ten were seriously wounded and thirty-three lightly wounded; 594 men were missing in action, many of them dead—642 casualties among the 2900 aircrew members involved in the mission, over 18%.

Moreover, the Schweinfurt raid was merely the climax of a week of maximum bombing effort which had taken heavy toll of Eighth Air Force planes and

crews. Four great raids between 8 October and 14 October had seen a total of 1342 heavy bomber sorties. 152 bombers (11.3%) were lost and another 6% received heavy damage. The casualties for the entire month of October, Eighth Air Force's month of greatest effort up to that time, were equally dire. A total of 214 heavy bombers had been lost during October, almost 10% of the number dispatched. The damage rate was 42% for both major and minor damage. Taken together, losses and damages mounted up to more than half of the credit sorties flown during the month. At this rate, an entirely new bomber force would be required almost every three months in order to maintain the bomber offensive.

Such losses were prohibitive. The Schweinfurt raid has become enshrined in Air Force history in the words which one of the surviving bomber crews applied to it—"Black Thursday." But the second week of October 1943 was, even more, a black week for the heavy bombers; and October was a black month. These losses were real ones. Their symbolic effects—both on aircrew morale and on Air Force strategy—were perhaps more important. For they overthrew the very basis of American air strategy: the belief that unescorted heavy bombers, owing to their strong defensive firepower and the high altitudes at which they operated, could penetrate German airspace on daylight bombing raids without excessive casualties. After Schweinfurt, it was clear that they could not, that the major belief underlying Air Force strategic doctrine had been proved wrong in combat. In higher command circles, as is not seldom the case in military history, an effort was made to put a good face on things. On the day after the raid, VIII Bomber Command estimated that "it may be possible for the Germans eventually to restore 25% of normal productive capacity but even that will require some time." This estimate was quite wide of the mark; in fact,

German bearings production dropped off by only about 5% during the last quarter of 1943, although production losses in certain categories produced by the Schweinfurt plants were as high as 33%.[3] Even these slight losses were quickly made good. But VIII Bomber Command's mistaken estimate was accepted in Washington. On 18 October, it was reflected in a press conference called by the Commanding General of the Army Air Forces, General H. H. Arnold, who exultantly announced, "Now we have got Schweinfurt!"

To the bomber crews in East Anglia, however, General Arnold appeared to have got it backwards. "We have *had* Schweinfurt" would in their view have been a more accurate way of putting it. As an aircrew member of the 384th Bomb Group, which lost twelve B-17s of sixteen committed to the Schweinfurt raid, wrote on the night after the raid,[4]

> It has come to be an accepted fact that you will be shot down eventually. The 384th entered combat four months ago with a combat flying strength of 363 officers and men. In these four months we lost more than we started with. We are just as strong, due to replacements that are continually coming in, but there are few originals left. . . . It is little wonder that the airmen of Grafton Underwood have by this time developed the idea that it is impossible to complete a full tour of duty.

Four days later, at the same time that General Arnold was holding his press conference, at a meeting of VIII Bomber Command wing and group commanders, the Commanding General, Brigadier General Fred L. Anderson, in effect, called off the bomber offensive against Germany. "We can afford to come up," he said, "only when we have our fighters with us." One of the bomber crewmen had put the matter less ele-

gantly at his de-briefing after the raid. "Any comments?" the de-briefing officer asked. "Yeah," he said. "Jesus Christ, give us fighters for escort!"[5]

II

As it turned out, the Air Force was able in the end to provide escort fighters. In February 1944, the Eighth Air Force, after marking time for four months, resumed its penetration raids on Germany with full, or almost full, fighter escort for "the heavies." In Operation ARGUMENT at the end of February—"Big Week," as it has come to be known in Air Force history—VIII Bomber Command launched a series of six major raids within little more than a week, a prolonged and bitter air battle over Germany which was the beginning of the end for the *Luftwaffe*. In early March, the new P-51 Mustangs of VIII Fighter Command took "the heavies" all the way to Berlin and back. And in the following weeks, VIII Fighter Command grappled with and crushed the German fighter forces. By 1 April 1944, the American Air Forces—the Eighth based in England, the Fifteenth based in Italy—had established command of the air over Germany, never again to lose it. It should be observed that during all this time, under this hail of bombs, German single-engine fighter production, the priority target for POINTBLANK, rose—if not steadily, notably at any rate. Single-engine fighter production for the first quarter of 1944 was 30% higher than for the third quarter of 1943, which we may take as a base figure. In the second quarter of 1944, it doubled; by the third quarter of 1944, it had tripled, in a year's time. In September 1944, monthly German single-engine fighter production reached its wartime peak—3031 fighter aircraft. Total German single-engine fighter production for 1944 reached the amazing figure of 25,860 ME-109s and FW-190s.[6] Seemingly, German fighter

production thrived on bombs.

But in fact, the German fighter force was no more. It had disappeared as an effective combat force in the great air battles following "Big Week." And on D-Day, Lieutenant General Werner Junck, commanding *Luftwaffe* fighters on the invasion coast, had on hand only 160 aircraft, of which only 80 were in operational condition. The entire *Luftwaffe* effort on D-Day, fighters and bombers alike, mounted to only about 250 combat sorties; it had negligible effect on the invasion forces. By contrast American aircraft mounted the staggering total of 8,722 sorties of all kinds on D-Day. The completeness of our command of the air is attested by the derisory losses taken by this great aerial armada—only 71 aircraft lost from all causes. General Eisenhower could truly say to his invasion forces on the eve of D-Day, "If you see fighting aircraft over you, they will be ours."[7]

But if it was a famous victory, it was, as concerns the means by which it was wrought, a completely unanticipated one, "an uncovenanted mercy" to rank with Oliver Cromwell's victory at Preston. For in producing, belatedly, the long-range fighters capable of escorting its heavy bombers, the Air Force surprised itself mightily. Indeed, in doing so, it went against its own better judgment about the character of air war. In retrospect it can be seen—and none of the authorities, I think, dissent from this view—that it was the commitment of the long-range fighter which alone made possible the resumption of the bomber offensive, shelved after Schweinfurt, and which brought about the defeat of the *Luftwaffe*. The official AAF history concludes its account of "Big Week" as follows:[8]

> The Allied victory in the air in early 1944, important as it was, must be considered in the last analysis a by-product of the strategic bomb-

ing offensive. It is difficult, however, to escape the conclusion that the air battles did more to defeat the *Luftwaffe* than did the destruction of the aircraft factories.

The RAF official history, *The Strategic Air Offensive against Germany, 1939-1945,* puts it more strongly.[9]

> . . . the achievement of "Big Week" and the subsequent attack on the aircraft industry was to reduce not the production of aircraft but the fighting capacity of the *Luftwaffe*. The attack on the aircraft industry was, in fact, another example of the failure of selective bombing. . . . This combat was provoked by the American heavy bombers which carried the threat of the bomb to the heart of Germany by reaching out to targets of deep penetration and leaving the German fighters with no alternative other than to defend them. But the combat was primarily fought and certainly won by long-range fighters of VIII Fighter Command. . . .

If this was the result, it was, however, no part of the plan. From the beginning of the war—indeed, from the 1930's—Air Force opinion about escort fighters had been equivocal in the extreme. The question of escort troubled people, it is true, but mainly because it encroached upon the dominant American, and, one might add, British, ideas about what an Air Force should be. It was studied time and again by one pursuit board after another between 1935 and 1942. But the conclusions, which were always the same until mid-1943, were essentially as follows: escort might be desirable but, in view of the defensive capabilities of the heavy bomber, it would probably be unnecessary; in any event, it was technically impossible, or nearly so; and even if it were not

quite impossible to provide long-range escort, fighters could not conceivably do the job.

If this seems an odd set of conclusions—and it was, in the light of what happened later—there were strong arguments in their support, nevertheless, and almost nobody in the American Air Corps or the RAF dissented from them. To see why this should be so, we must turn back for a moment to consider the evolution of the doctrine of air war during the 1930's.[10] At the time, this was the responsibility of the Air Corps Tactical School at Maxwell Field, which, despite its somewhat misleading title, served in fact as the Air War College. Our air doctrine emerged during the 1930's at the hands of a group of young captains and majors who made up the ACTS faculty and whose names form a kind of roster of the Army Air Force's high command during the second World War. Their studies and speculations produced a coherent approach to strategy which rested upon an interlocking set of beliefs—or, if you will, assumptions—about air warfare.

Foremost, and basic, the ACTS faculty outlined a new approach to war, a new view of what war is and what its proper objects should be. This view, although a novel one, reflected fairly accurately the experience of the first World War, itself novel among wars, and foreshadowed that of the second World War. It was, in a word, the concept of "total war." This concept, while not held only by airmen, was certainly most attractive to them. It rested on a refusal to make any distinction, from the point of view of strategy, between the armed forces of the enemy and the civilian population and industrial structure which support those armed forces. Under conditions of total war, it was argued, the latter constitute as legitimate an objective of military action as do his armed forces; under certain circumstances, they can be a far more profitable objective. As the first World War had shown, the

military are directly and heavily dependent upon the civilian economy. The modern industrial economy is a very complex and delicately balanced mechanism, its operations marked by a high degree of specialization of function. Specialization, in the view of these airmen, was at once the strong point of the modern industrial economy, providing as it does a high degree of efficiency—and its weak point. For vital industrial functions may be, and often are, concentrated in two or three factories; if their production were knocked out by aerial bombing, or even seriously impaired, the effects on the enemy economy might be serious and could, at their worst, lead to something like industrial paralysis.

Thus, the emergence of air power, it was argued, presented an entirely new means of defeating the enemy. There was, it is true, some confusion in the minds of these airmen about the precise strategic implications of this new weapon. From one point of view, the effects of air bombardment might be considered indirect in their operation; bombing might be aimed, indirectly, at reducing the fighting efficiency of enemy military forces by action against the home front, softening up the enemy for the kill, so to speak, by one's own armed forces. This was, in fact, the air strategy pursued by the Western Allies in the war against Germany. During the 1930's, however, and during much of the second World War, most airmen preferred to think in terms of a direct air strategy—direct in the sense that it was aimed straight at the sources of enemy military power, his industrial economy, not at its periphery, his military forces. Strategic bombing, it was argued, could have such powerful effects on enemy supply and armament production and on civilian morale as greatly to reduce our dependence on conventional forces—armies and navies—for the prosecution of our strategy. Indeed, not a few airmen believed that air power might

make armies and navies obsolete.[11]

On one key point, however, there was general agreement: *an air force need not meet and defeat the enemy air force before going on to the bombardment and destruction of his industrial economy.* This belief was put most clearly by the commander of the RAF, Lord Hugh Trenchard, in a memorandum entitled "The War Object of an Air Force," which he laid before his colleagues on the British Chiefs of Staff Committee in 1928.[12]

> It is not necessary . . . for an air force, in order to defeat the enemy nation, to defeat its armed forces first. Air power can dispense with that intermediate step, can pass over the enemy navies and armies, and penetrate the air defenses and attack direct the centers of production, transportation and communications from which the enemy war effort is maintained.
>
> This does not mean that air fighting will not take place. On the contrary, intense air fighting will be inevitable but it will not take the form of a series of battles between the opposing air forces to gain supremacy as a first step before the victor proceeds to the attack of other objectives. . . .
>
> For his main operation each belligerent will set out to attack direct those objectives which he considers most vital to the enemy. Each will penetrate the defenses of the other to a certain degree. The stronger side, by developing the more powerful offensive, will provoke in his weaker enemy increasingly insistent calls for the protective employment of aircraft. In this way he will throw the enemy onto the defensive and it will be in this manner that air superiority will

> be obtained, and not by direct destruction of air forces. The gaining of air superiority will be incidental to this main direct offensive upon the enemy's vital centers and simultaneous with it.

It was all put more succinctly by a member of the ACTS faculty, Captain Harold L. George, who later was to command the Air Transport Command during the second World War. "The spectacle of huge air forces meeting in the air," he wrote in 1935, "is the figment of imagination of the uninitiated."

The implications of this view are worthy of note, for they were to loom very large over Air Force plans and intentions during 1943. They may be summed up as follows: it might be necessary to fight to defend one's right to exploit the air for offensive purposes, but it would not be necessary to fight to assert it. This opinion was reinforced by another view which reflected fairly accurately the fighting experience of airmen during the first World War: the proper, indeed, the only profitable, employment of an air force was the offensive. Air fighting in 1915-1918 had clearly shown the weakness of a defensive posture in air war. Possession of the initiative in war has always permitted great economies of force; in air fighting during the first World War those economies had been doubled and redoubled. An air defense, it was found, required forces utterly disproportionate to those required for the offense. There were many examples to support this view. The experience of the French Air Force during the Battle of Verdun is a case in point. But it is seen most clearly in the oft-quoted effects of the random German bombing attacks against England in 1916-1918. The Royal Flying Corps in 1916-1917 had employed sixteen fighter squadrons against the German Zeppelin attacks. Against the German Gotha bomber squadrons, which never numbered more than forty aircraft in all, the British were forced to com-

mit 159 day fighters, 123 night fighters, 266 antiaircraft guns, 353 searchlights, as well as a commitment of personnel for manning barrage balloons. In terms of aircraft, the ratio between the defensive and the offensive effort was as 7 to 1. In terms of total effort, it was much higher.

Improvements in bomber design during the 1930's, moreover, appeared greatly to increase the inherent strategic advantages of the aerial offensive. The American B-9, B-12, and B-17 were very little, if any, slower than the American fighters of the day. With its great speed, the bomber was considered to be unstoppable in these days before the development of radar had revolutionized air defense. Fighters, it was estimated, required a speed advantage of 40 to 50% over the bomber in order to maneuver successfully against it. In tests against the B-12, the old P-12 Hawks, and the Boeing P-26s they had nothing like that advantage. These tests were by no means conclusive proof of the superiority of bomber over fighter. Captain Claire Chennault, ACTS instructor in pursuit tactics, criticized them vigorously and, on the whole, not unfairly for "stacking the deck" against the fighters.[13] But Chennault's protests, however, went unheeded. And the lessons of the 1930's, as they were read by most airmen of the day, were summed up in the comments of one faculty member of ACTS,[14]

> Military airmen of all nations agree that a determined air attack, once launched, is most difficult if not impossible to stop. . . . The only way to prevent an air attack is to stop it before it gets started—by destruction of the bombers on the ground.

All this being so, the bomber, it seemed, was the basic air force weapon. It was the most economical instrument of air power. It gave, it was widely be-

lieved at the time, promise of gaining a rapid decision in war by striking directly at the enemy's productive machine and the morale of his civilian population. It appeared, moreover, to be almost invulnerable to the defense. The British Prime Minister, Mr. Stanley Baldwin, expressed a widely held opinion when, in 1934, he observed, "The bomber will always get through."

Finally, there was the question of escort for the bombers. The Air Force's ideas on the matter followed logically enough from the foregoing. They were wrong—but they were logical. For one thing, the need for escorting bombers, as one Air Corps study board of the 1930's put it, "has not as yet been thoroughly demonstrated." It was generally felt that the high altitude, the speed, and the defensive fire power of the modern bomber would permit it to defend itself successfully, in formations, against enemy interceptors. Nevertheless, the matter was kept under study by a succession of pursuit boards and committees of one kind and another set up between 1935 and 1942. From all these studies two main conclusions emerged which—unfortunately—became imbedded in American air doctrine. First, it appeared that the performance standards requisite for an escort fighter were such as to make it a technical impossibility. This sentiment made its first appearance in the report of a board set up in 1935 to establish performance standards and specifications for pursuit aircraft in light of the recent breakthroughs in bomber design and performance. This board prescribed the following specifications for escort pursuit planes:

1. construction safety factors at least as high as those required for interceptors.

2. top speed at least 25% greater than that of bombardment aircraft.

3. range at least as great as that of bombardment aircraft.

4. service ceilings as high, preferably higher than, those of bombardment aircraft.

5. a high rate of climb.

From all this, the 1935 Board came to the puzzling conclusion that such a plane "would apparently be larger than the bomber," requiring three engines rather than the two engines customary on bomber aircraft at that time. Clearly, it seemed, such an aircraft would not have the performance characteristics of a fighter plane.[15] Most of the subsequent pursuit boards came to the same perplexing conclusion. Another study undertaken in 1940 concluded its treatment of escort fighters with the following words:[16]

> It is obvious that no fighter airplane can be designed to escort medium and heavy bombardment to their extreme tactical radius of action and then engage in offensive combat with enemy interceptor fighter types on equal terms. Therefore the most that can be accomplished in this respect is to provide an escort fighter which will augment the defensive fire power of the bombardment formation, especially at the rear where it is most vulnerable to attack by hostile interceptors.

RAF experience during the early stages of the air fighting in Europe appeared to support these recommendations. Colonel Ira Eaker, later Commanding General of the Eighth Air Force, on a visit to the United Kingdom in 1940 found the British skeptical of long-range fighters. During the Battle of Britain

and the Blitz, British fighters had found that the German ME-110s and ME-210s, designed as penetration escort fighters, were "cold meat" for their Spitfires and Hurricanes. And their own Typhoons and Tornadoes had proved unable to contend on equal terms with ME-109s. On the basis of this experience the British strongly advised against the development of what they called a "compromise fighter." The best that could be done, the British Chief of Air Staff, Sir Charles Portal, told Eaker, was an escort plane "built exactly like a bomber. . . . [designed to] surround bombardment formations and carry guns as heavy as any which enemy fighters could bring against them."[17]

This view was reflected in the recommendations of the last Air Force board to study the question before American entry into the war—a board on which Colonel Eaker sat as a member along with Colonel Frank O'D. Hunter, who, in 1942, was to find himself leading VIII Fighter Command in England. Its conclusions on the escort fighter followed in the well-trodden paths of all the earlier studies. The board conceded that "only with the assistance of such an airplane may bombardment aviation hope to successfully deliver daylight attacks deep inside the enemy territory and beyond the range of interceptor support." Despite this, it did not recommend development of such an airplane.

> The Board [their report concluded] is unable to say whether or not the project is worthwhile and can only point out the need for furnishing day bombardment with the very maximum attainable defensive power if that form of attack is to be chosen to gain a decision in war against any other modern power.

As a result, the board recommended for escort air-

craft a sixth priority among the other fighter types in development at the time, late 1941. Under the circumstances of the time, sixth priority, of course, was tantamount to no priority at all.[18]

The conclusions of all of these prewar studies may be summed up in a word: for technical reasons, only a bomber could escort bombers. This, it should be emphasized, was nearly the unanimous opinion of both British and American airmen. Furthermore, as the RAF official history puts it:[19]

> The incentive to grapple with the formidable technical problems involved in the production of an effective long-range fighter was, perhaps, blunted not only by the authoritative opinion that the task was impossible, but also by the suspicion that it was unnecessary. The belief still lingered that heavy bombers might yet be cast into self-defending formations capable of carrying the war to the interior of Germany in daylight.

From this, too, flowed another conclusion about the role of escorts which was to hamper American fighter operations until well into 1944—and which until the present time has prevented us from grasping fully the role which the fighter played in the defeat of the *Luftwaffe*. Almost all American airmen looked upon the bomber as the dominant instrument of air warfare. This being so, the role of the fighter could only be regarded—and was regarded—as second in importance to that of the bomber. And the tactical function of escort aircraft was envisaged as basically a defensive, even a passive, one. This view was put very clearly in the report of the 1940 Pursuit Board which defined the function of escort in the following words:

> . . . to follow or accompany the particular unit

> being supported and to provide air security for the escorted force. This task involves defensive action against fighter aircraft.

"Defensive action against fighter aircraft," unavoidably, is somewhat ostrich-like. There is question as to whether it can be considered to be "action" at all. But the Pursuit Boards did not blink at the paradox. Still another board, set up in 1941, stated the matter in plain language. What was required, in their view was a "convoy defender." Their report, indeed, made an explicit distinction between the "convoy defender" and the long-range fighter whose functions, as they envisaged them, were the maintenance of air alerts and distant patrols, support of ground forces and intruder operations.[20]

The same view found its way into the Air Force's basic war plan—AWPD/1—drawn up in the summer of 1941.

> Escort must be designed to fill one role: defense against hostile pursuit. The escort fighters would initially take positions on the flanks and rear of the bombardment formations. When combat was forced these planes would be maneuvered to positions where the maximum hostile pursuit attack was developing. In substance the escort fighters would be so disposed that hostile pursuit could not attack the bombardment formation with impunity without first passing through the fire of the fighters or without first disposing of them.

Escort's function, thus, was a simple one—to get shot down first. This was not an attractive function, of course. It was not deemed a very important one, either. AWPD/1 called for procurement of thirteen experimental models—modified bombers "designed solely for defensive purposes"; its recommendations

on this topic, however, were ignored. When it was revised with the publication of AWPD/42, dated 9 September 1942, which reflected the early combat experience of the B-17 in England, the matter of escort for heavy bombers was not even mentioned as such. It was estimated that American day bombers, without escort, could bomb Germany with losses that would probably not exceed 300 bombers in all. This, of course, was considerably less than the number of heavy bombers shot down over Germany in September and October 1943 alone.

Thus, summing up the effects of doctrine on American air strategy in Europe, we may say that for reasons of both a strategic and a technical character—which, incidentally, supported or seemed to support each other—the bomber was regarded as the main, perhaps the sufficient, weapon. It was given every priority. The fighter was given an ancillary role, at best. Its functions were adjudged to be entirely defensive in character. And despite certain reservations about the vulnerability of the B-17 and the B-24 to enemy fighter attack, the Air Force made no provision for an escort fighter. On no point was American air doctrine more clearcut. On no point was it to prove so wrong.

III

The crisis of 1943—which culminated in the Schweinfurt raid in October, but which had been building up steadily during the preceding months—brought a rude awakening. Some bomber commanders were slower than others to see the handwriting on the wall. As late as July 1943, one Eighth Air Force bombardment wing commander could write,[21]

> There is no question in my mind as to the eventual result. VIII Bomber Command is destroying and

> will continue to destroy the economic resources of Germany to such an extent that I personally believe that no invasion of the Continent or Germany proper will ever have to take place.

He felt this despite the fact that a month earlier, on VIII Bomber Command's first raid into Germany (on Bremen and Kiel), his own Wing had lost twenty-two aircraft out of sixty attacking—37% of his force—to German fighter attacks. And VIII Bomber Command as a whole had lost 16% of its attacking force, while over 70% of the returning bombers had been damaged.

Old ideas die hard. But this kind of thinking became increasingly rare in the Eighth Air Force as the summer of 1943 wore on. The hard knock over Kiel—"a sobering defeat," as the AAF official history calls it—was the first which the Eighth Air Force had taken. It was to prove merely the first of a series of hard knocks. VIII Bomber Command, it is true, had taken serious losses in its earlier operations against French and German coastal targets. Its combat losses for the six months January through June 1943 had averaged 6.6%, and the damage rate averaged 35.5% in those months. Those losses, however, could be explained away—and they were explained away. Owing to the diversion of heavy bombers to the Pacific and the Mediterranean theaters the build-up of VIII Bomber Command's "heavies" had lagged far behind the anticipated rate. During the first half of 1943, it had risen slowly from four bomber groups in January to thirteen in June, and its effective operational strength was little more than 200 heavy bombers at the end of the period. A force of this size, it was argued, could not commit bomber formations large enough to provide their own defense or to mount diversionary operations in order to decoy and pin down the *Luftwaffe* fighter forces. In this matter, as is so often the case in military history, bomber commanders

relied on a "magic number"—300 bombers. A smaller number, it was felt, was bound to get hurt by the German fighters. As General Eaker had written to General Arnold in October 1942, Eighth Air Force commanders were "absolutely convinced that. . . 300 heavy bombers can attack any target in Germany with less than 4% losses."[22] Until attacks on that scale had been attempted—and this had been impossible before July 1943—the bomber commanders were inclined to discount the significance of the losses on their early operations.

Their optimism was bolstered by another notion—the notion of the German "fighter belt," as the phrase went. In 1942 and early 1943, it is true, the main German fighter defenses had been concentrated forward, on the coastline of France and the Low Countries. From these forward positions the *Luftwaffe* fighters had put up a stiff and unyielding defense. But once the "fighter belt" had been penetrated, it was felt, German resistance further inland would not be so stiff. If "the heavies" could be provided with enough fighter escort to break the "fighter belt," they might thereafter range at will over Germany. Operations in March 1943, particularly the successful and lightly contested bombing of Vegesack on 18 March, on which only two "heavies" were lost out of 97 dispatched, seemed to bear out this view. General Carl Spaatz reflected the widespread optimism in Eighth Air Force circles after Vegesack when he wrote to Eaker on 8 April 1943,[23]

> I am just as convinced as ever that the operations of the day bombers, if applied in sufficient force from the United Kingdom, cannot be stopped by any means the enemy now has and your more recent raids should have gone a long way toward demonstrating that fact to the more persistent unbelievers.

In July 1943, both these ideas were tested and found wanting. 300-bomber raids became possible for the first time, and, also for the first time, limited penetrations of German airspace were attempted. German fighter defenses, however, were found to be even stiffer than they had been previously. Cannon-firing ME-109s proved more than a match for the B-17s with their defensive 50-caliber machine guns. New fighter tactics—particularly the overhead pass and the head-on pass by cannon-firing, and later in the year, rocket-firing German fighters—easily penetrated the bombers' defensive boxes and on some occasions broke them up completely. It became clear, too, that the *Luftwaffe* fighters were under continuous control by radar-equipped ground control stations capable of pursuing systematic and elaborate defensive strategies which VIII Bomber Command had no means of countering at that time. There was no German "fighter belt." Rather, there was an elaborate fighter grid, disposed in great depth backwards from the coast, and capable of deploying large—and growing—fighter forces over wide areas and directing their operations with great flexibility. The *Luftwaffe* could not stop the raids; it is rightfully the proud boast of VIII Bomber Command that German opposition never turned its heavy bombers away from their assigned targets. But it was becoming increasingly clear that the German fighter defenses could impose—and were imposing—heavy and growing losses on the bomber formations, approaching 50% in certain cases.

During the summer months of 1943, the air battles over Germany—over the fringes of Germany, it should be emphasized, for VIII Bomber Command attempted no deep penetrations of Germany until August 1943—were taking on precisely the character which American air strategists had least expected. Air warfare was developing into attrition war on a large scale, larger than American air planners had ever foreseen. The

prize was mastery of the air over Germany. And the German fighters, if they were not winning the air battle, did not appear to be losing it. As a consequence, VIII Bomber Command combat losses rose seriously in the latter half of 1943. In July, losses were 6.8%; the damage rate was 62.5%, some serious, some trivial. In August, during the first half of which VIII Bomber Command, exhausted by its efforts in July, slackened its operations, losses, nevertheless, remained at 6.5%, and the damage rate was 31.5%. And in October, POINTBLANK reached its crisis; in that month, as we have seen, VIII Bomber Command's losses reached a prohibitive level—9.9% of its bombers were shot down or crashed and 41.7% sustained damages. After Schweinfurt, no more penetration raids were attempted.

In this rising crisis, it is difficult, studying the historical record, not to feel that there occurred something like a breakdown of communications, or of understanding, at any rate, between Air Force Headquarters in Washington and the commanders in the field. It is not an easy thing for the historian to lay his finger on. One does sense among at least some of the bomber commanders in England a mood of urgency, a sense of approaching crisis for the POINTBLANK strategy, which seems not to have communicated itself fully to Washington and which, to the extent that it did, was not fully appreciated there. This is partly attributable, perhaps, to a lack of candor on the part of the bomber commanders. Military men are usually loath to burden their superior officers with their own troubles. General Arnold, for his part, was a commander who was apparently less willing to be burdened with others' troubles than another commanding general might have been. It is attributable also to a natural unwillingness of the bomber commanders in England to admit that their ideas about strategic air power,

and the official estimates of the situation which for more than a year they had forwarded back to Washington, had not worked out in practice. Partly, too, the bomber commanders' picture of the air battles was distorted by the exaggerated claims of VIII Bomber Command crews in regard to numbers of enemy fighters shot down in action. On the October Schweinfurt raid, for example, bomber crews claimed 186 enemy fighters destroyed; the actual German losses were 38. Claims such as these were the usual thing and led the bomber commanders greatly to overestimate the attrition their raids were imposing on the Luftwaffe.

Whatever the motives behind the actions of the Eighth Air Force commanders, their explanations of VIII Bomber Command's losses between June and October 1943 do not seem, in afterlight, to reflect accurately the dimensions of the approaching crisis of POINTBLANK. In dispatch after dispatch they characterized the German successes as, in effect, the last gasp of the Luftwaffe. Thus, in his Tactical Mission Report after the raid on Kiel in June, one bombardment wing commander called the German reaction "a desperate but vain attempt to stop daylight bombing."

> This suicidal defense by the German fighter force [he wrote] will quickly attrite the one opposing factor of any consequence to our heavy bombardment forces. As our bombardment force grows, successive and relentless destruction of German war installations will be accomplished.

If the experience of the succeeding months failed to bear out this conviction, the idea, nevertheless, had firmly lodged itself at Air Force Headquarters in Washington. Indeed, on 14 October, the day of the second Schweinfurt raid, Arnold cabled Eaker that,

according to the evidence as it appeared in Washington, the Luftwaffe was on the verge of collapse, and Eaker, on the next day, supported that estimate. "There is not the slightest question," he wrote, "but that we now have our teeth in the Hun Air Force's neck." He likened the German defense of Schweinfurt to "the last final struggle of a monster in his death throes."[24]

At the same time there was a growing awareness, by no means yet clearcut, that in some way or another fighter escort had to be provided for the heavy bombers. In June, in the aftermath of the Kiel raid, Eaker had mentioned long-range fuel tanks for fighters as only his third greatest need. On the other hand, he convinced Mr. Robert Lovett, the Assistant Secretary of War for Air, who visited England during the same month, that development of a long-range fighter, specifically the P-47, should take a commanding priority; and on his return to Washington, Lovett gave that program the first vigorous push it had yet received. The summer raids further highlighted the importance of fighter protection. VIII Fighter Command disposed only three or four fighter groups during those months, and fighter combat radius, as we have seen, was severely limited. Even so, the effects of fighter escort on the bombers' losses were formidable and unarguable. Statistics produced by Eighth Air Force's Operational Research Section in early autumn 1943, showed that an unescorted bomber mission took seven times the losses and two and a half times the damage sustained by missions given full fighter escort, and that a partially escorted bomber mission took five times the loss and twice the damage sustained by fully escorted ones. These statistics were based on thirty-eight missions mounted during July, August, and September 1943; the figures for October, when they became available, were even more persuasive.[25]

Bomber commanders were fully aware of these facts. They demanded and got fighter escort whenever it was available. All bomber missions into France and the Low Countries were given full escort and American fighter pilots—the "little friends," as they were known—found a warmer welcome from their "big friends" in the skies over German-held territory than they had always received in bomber group bars and grills. But despite the fact that Germany was a more difficult target, only peripheral fighter escort could be provided for the penetration raids. RAF Spitfires and VIII Fighter Command P-38s took them across the Channel; Thunderbolts took them inland as far as they were able. After that point—roughly the western border of Germany—the bombers were getting worked over pretty thoroughly by *Luftwaffe* fighters. In some respects, it must be conceded, the German fighter forces were at their "last gasp"; despite their triumphs of late 1943, weaknesses already were apparent to the German fighter commanders which, under the relentless VIII Fighter Command pressure in 1944, brought the collapse of the *Luftwaffe*. Without that pressure, however, they might never have manifested themselves. In any event, these weaknesses were not apparent to VIII Bomber Command aircrews at the time. After Schweinfurt they, too, knew something about "last gasps."

By autumn 1943, it was clear that, whatever prewar doctrine may have said, escort fighters alone could salvage Operation POINTBLANK. Although the need was urgent, it cannot be said that the actions taken to deal with it were. This was partly attributable to the old ideas about the "convoy defender," the belief that only a bomber could escort bombers. Much time was wasted in development of the YB-40, a modified B-17 with heavier armor and armament. This program had been set on foot by the recommendations of an Eighth Air Force board set up in August

1942 to study, with the usual results, the familiar problem of escort. It was pursued with top priorities during late 1942 and early 1943, and much was expected of the aircraft. Twelve YB-40s were delivered to VIII Bomber Command in late May 1943. They quickly proved a complete failure. They could not climb at the same rate as the B-17s, nor could they keep pace with them, especially after the bombing runs had been completed. And, with only 20% more firepower than the B-17, they were ineffective against enemy fighters. On 1 July 1943, General Eaker requested discontinuance of the YB-40 project. When Washington proposed that similar modification be attempted to make the B-26 into a "convoy defender," Eaker opposed the project and it was ultimately dropped.[26]

The YB-40, that belated obeisance to prewar doctrine, while it had no other effects, did serve for a time to divert attention from two projects that did promise, and ultimately produced, relief for the heavy bombers—range extension development for the P-47, and later, the emergence of the greatest "dark horse" of the war, the P-51 Mustang. The issue of range extension turned on two matters: an increase in the internal fuel tankage of the P-47, a problem solved easily enough, and the development of external, droppable fuel tanks suitable for combat. Now, auxiliary fuel tanks were not an easy problem technically. What is more important, the question got bogged down in perhaps the most thorough Air Force bureaucratic muddle of the second World War. As early as October 1942, Eighth Air Force had inquired whether jettisonable fuel tanks could be made available for the P-47. Nothing came of the request. In February 1943, an Assistant Chief of Air Staff, Brigadier General Benjamin Chidlaw, requested information from the Air Materiel Command at Wright-Patterson Field about the status of the P-47 belly tank

program, among others. It is not clear from the record what response was forthcoming to this request from Wright-Patterson, but it is clear that little was accomplished up to 29 June 1943, when AMC belatedly held a final design conference on P-47 auxiliary tanks, among others under development. On 8 August 1943, however, AMC had to confess that although some experimental types had been completed, none were yet available for use in operational theaters.

Meanwhile, VIII Fighter Command had developed its own belly tanks by means of contracts with local suppliers, despite shortages of materials in England which forced the English suppliers to fabricate the tanks out of a kind of cardboard. V Fighter Command did the same, producing amid the New Guinea jungles —presumably from old Spam cans—an auxiliary tank for P-47s superior to that produced, belatedly, by Wright-Patterson. General Arnold, who, himself, had only lately seen the importance of combat range extension, was disconsolate at this. "There is no reason in God's world," he wrote, "why General Kenney should have to develop his own belly tanks. If he can develop one over there in two months, we should be able to develop one here in the States in one month."[27] In fact, it took eleven months. Not until Mr. Lovett's return from England in June 1943, was the program pursued with any urgency. Even so, it was pursued by fits and starts; in September 1943, it was found that monthly production of the 150-gallon belly tanks for the P-47 was only 300, as against Eighth Air Force requests for 22,000. Not until December 1943 did production begin to approximate the plangent and obvious needs of the situation. All these delays in a program so long under development and so vital to our air strategy are inexplicable—and indefensible. Materiel development should anticipate and forestall the needs of field commanders; at least, it should

seek to accommodate them. In the matter of auxiliary tanks, the Air Materiel Command lagged far behind events and, for that matter, explicit requirements. It is difficult to dissent from the opinion of Brigadier General Hume Peabody, who examined the matter for General Arnold in August 1943 and reported that "it indicates a lack of forward thinking."

The effects of increased internal tankage and auxiliary tanks on the combat capabilities of the P-47s were extraordinary. On its first entrance into action on escort missions, on 4 May 1943, the Thunderbolt's range had been about 175 miles; its deepest penetration prior to the development, by VIII Air Service Command, of English-produced auxiliary tanks, had been on 17 July when "Jugs" had taken the bombers as far as Amsterdam, about 200 miles. On 28 July, using the British cardboard tanks—which restricted altitude to 22,000 feet—they went all the way to Emmerich, 260 miles from their bases, an exploit which greatly discomfited German fighter controllers and, even more, German fighter pilots who encountered them for the first time so far inland. On 27 September, the longlegged "Jugs" proved their mettle and underlined the importance of escort. On that day, they took the B-17s all the way to Emden and back. As a result, bomber losses on that mission were only 3% of the attacking force, far below the prevailing averages. By March 1944, the combat range of the P-47s had been extended all the way to Helmstedt, over 400 miles from their bases in East Anglia.[28] By January 1944, indeed, most of Western Germany had come within P-47 range. This was crucial. The February air battles, which saved Operation POINTBLANK, were fought almost entirely by Thunderbolts. And they remained the Eighth Air Force's workhorse fighter until gradually supplanted by the P-51 during the summer of 1944. I hope you will not take it as merely the maunderings of a former "Jug" pilot if

I observe that it was the "Jug" that first put the German Fighter Command back on its heels. Others were to exploit the victory; the P-47 won it.

But the real "dark horse," of course, was the P-51. Its history comprises one of the strangest stories of the war. The fact is that in the P-51, the Air Force, without knowing it, had all the time had at its disposal what was to prove the finest fighter of the war. In its origins the P-51—or the Mustang, as it is perhaps more proper to call it, in view of its parentage—was a British project. During the winter of 1939-1940 the RAF, anxious to extend its purchases of the P-40 Tomahawk, approached the North American Aviation Corporation with a view to getting North American to produce the P-40 on contract from its prime contractor, Curtiss-Wright. North American countered the British request by offering to design a fighter on its own, which it proceeded to do in the remarkably short time of 117 days. The result was the Mustang, which the RAF purchased in modest numbers from 1941 onwards, and which it used as a tactical support fighter for the ground forces, a task for which it was not, in fact, well suited. As a matter of courtesy, the Air Force received two Mustangs for experimental purposes. It was not impressed. However, in 1942—partly with an eye to employment conditions in Inglewood, California, where the Mustang was built—the AAF ordered some hundreds of Mustangs, which it converted into a dive bomber, designated the A-36 Invader, and used with indifferent success in the Mediterranean Theater during 1943.

In truth, the Mustang's performance with its original power plant, the GM Allison engine, was not sensational. But the RAF saw possibilities in it. In the summer of 1942, they dropped a Rolls-Royce Merlin 61 into the Mustang—and the results *were* sensational. In October 1942, shortly after the first Merlin Mustang flew, our assistant Air Attache in London,

Major Tommy Hitchcock, the old ten-goal international polo player, tried it out. He immediately reported to Washington that the Merlin Mustang was "one of the best, if not the best, fighter airframe that has been developed in the war up to date"; it compared favorably, he reported, with the Spitfire, currently considered the world's best fighter.[29] Air Marshal Trafford Leigh-Mallory, the RAF Fighter Commander, and Captain Eddie Rickenbacker confirmed Hitchcock's report, so strongly, indeed, that President Roosevelt himself, that notable fighter plane expert, took an interest in the matter. The AAF thereupon ordered 2200 P-51Bs, as the first model of the Merlin Mustang was designated, in November 1942. Even so, its development was not pushed with any sense of urgency, and it was lost in the shuffle for reasons which Tommy Hitchcock summed up in horseman's language—"sired by the British out of an American mother, the Mustang has no parent in the AAF or at Wright Field to appreciate and push its good points."[30]

Not until the summer of 1943 was much done about the P-51. In June 1943, Mr. Lovett returned from England convinced by Eaker and General "Monk" Hunter, VIII Fighter Commander, that the development of escort fighters was vital to the success of the bombing offensive. At Lovett's insistence, General Arnold on 28 June 1943 ordered the whole question of escort fighters to be gone into thoroughly, for the first time since our entry into the war. Moreover, he ordered the development—by modification of existing types, if possible; "from scratch," as he put it, if necessary—of a long-range fighter capable of accompanying the heavy bombers all the way to their targets and back. Lovett, reflecting VIII Fighter Command opinions, seems to have looked to the P-47 as the most likely answer to the escort problem. General Arnold thought the P-38 might be the item. The matter

was turned over to Colonel Mervin Gross, the Assistant Chief of Air Staff for Materiel, Maintenance and Distribution, who initiated an examination of all fighter aircraft considered capable of being modified for use as escort fighters. Colonel Gross's report, on 3 July 1943, highlighted for the first time the possibilities of the P-51, despite all the earlier talk about its excellence. Performance tests at Eglin Field revealed that the Mustang was, indeed, a superior aircraft, far superior, in fact, to its German counterparts. It was 50 m.p.h. faster than the FW-190 at altitudes up to 28,000 feet, about 70 m.p.h. faster above that altitude. It was 30 m.p.h. faster than the ME-109G at 16,000 feet and 50 m.p.h. faster at 30,000 feet. It could outdive the FW-190 at any altitude and could outdive the ME-109G in prolonged dives. It clearly out-turned the ME-109 and was marginally superior to the FW-190. Only in rate of roll was it adjudged slightly inferior to the FW-190, though not the ME-109.

If its performance was remarkable, the P-51's range was even more so. In its original form, built to British specifications, its combat radius had been less than 200 miles. Increases in internal tankage and external wing tanks greatly extended its range. In its first escort mission for VIII Fighter Command, on 13 December 1943, the Mustang took "the heavies" all the way to Kiel and back, a combat radius of 490 miles, the record escort mission to that date. In March 1944, it accompanied the bombers all the way to Berlin, 560 miles from its bases, and back. By mid-1944 it could take them as far as Polish and Silesian targets. By the end of the war in Europe, indeed, the P-51 had a longer combat radius of action than did the B-17.

It all makes an amazing and instructive story, the history of the P-51. It should warn us against using the word "impossible" too quickly. It should warn us, too, against accepting too easily and too completely

the teachings of doctrine. For the conclusion is irresistible that it was prewar doctrine as much as technical and production difficulties—probably, in fact, more than they—that deprived the Air Force of a long-range escort fighter. The P-51, after all, had been there the whole while. It was only at a very late date, when crisis and defeat loomed, that it was noticed. And we may say of the P-51, as the Duke of Wellington said of the Battle of Waterloo, "It has been a damned serious business. . . the nearest run thing you ever saw in your life. . . !"

IV

With the emergence of the P-47 and the P-51, VIII Fighter Command got the tools with which to do the job. It finished that job with extraordinary rapidity once it set its hand to it. The defeat of the German Air Force before D-Day is, indeed, the classic example of the fragility, the inherent instability, of command of the air. Between January and June 1944, the *Luftwaffe* suffered the fate which RAF Fighter Command might have suffered—and came very near suffering—in the Battle of Britain. The margin which separates defeat from victory in air warfare is closer even than it is in other forms of war. In January 1944, the *Luftwaffe* fighter defenses, fresh from their triumphs of October, were supreme. In that month, General Marshall reported to the Combined Chiefs of Staff that, thus far, the Combined Bomber Offensive had hit only about 20% of its assigned targets, only five months before the invasion of Normandy was scheduled to go ashore. By June 1944, the *Luftwaffe* was a defeated air force. Until the end of the war it retained its ability to hit and severely to hurt the bomber formations. But increasingly it had to call its shots. After the "Big Week" air battles, it ceded the initiative to VIII and XV Fighter Commands.

The American fighters exploited their opportunities

to the full. This, it should be emphasized, was not the result of any specific strategic decision. It was the result, rather, of tactical decisions made on the spot by fighter group combat leaders. At the same time that fighter combat ranges were being increased, the numbers of American fighter planes in the European Theater had gradually increased. From four fighter groups in July 1943, VIII Fighter Command rose to ten groups—750 aircraft—by December 1943, and thirteen groups, including only two P-51 groups, by February 1944. With their greater strength, the fighter leaders began to lay less emphasis on escorting the bombers and more on chasing and harrying the German fighters. Commencing in January 1944, fighter groups began to divide their forces between defensive and offensive missions; one squadron hung about to give close escort to "the heavies" while the remaining two squadrons ranged far afield, seeking combat with enemy interceptors on our terms, not theirs. These tactics produced quick results. They confused German fighter controllers, who found it increasingly difficult to read the patterns of American air operations as they developed. By hitting German fighter airfields, American fighters made it difficult for the Germans to fly second sorties against the same raids, a tactic on which much of their previous success had rested. Most important, after January 1944, these tactics imposed an increasingly heavy wastage on German fighter units, both on the ground and in the air.

The new fighter tactics were the cause of some rather sour and certainly shortsighted criticism from the bomber groups. One bombardment group commander forwarded a complaint which summed up an all-too-common reaction.[31]

> It is suggested that in some instances our friendly fighters have been more intent upon destroying

> enemy fighters than in staying with the bombers. In particular it appears that we might question their tactics of chasing enemy fighters down to 16,000 or 12,000 feet when our forces are a mile or so above this level. It may be that we could have a net gain in the effectiveness of their support if pursuit of enemy aircraft were limited to a reasonable chase in the more or less immediate vicinity of our formations.

The loosing of the fighters from close escort missions was sound strategy, and it was soon extended. By April, VIII Fighter Command was ordering low-altitude fighter sweeps deep into Germany, some undertaken in conjunction with bomber missions, others planned as independent strikes employing all of its fighter groups. For the first time, fighters were being used in their true role—an offensive role. As the spring months wore on, the disruptive effects of VIII Fighter Command operations—on German fighter units, on *Luftwaffe* training units, and on the whole structure of the enemy air force—forced the *Luftwaffe* increasingly off balance and shifted the balance in the air increasingly towards the Anglo-American side.

The effects of these new tactics were intensified, in turn, by serious German strategic mistakes. The most obvious of these was their failure, almost entirely the responsibility of Hitler, to push forward the development of the jet-powered ME-262 as a fighter aircraft. The months wasted in experimenting with its possibilities as a "blitz-bomber"—to use Hitler's phrase—could never be regained. It might not have turned the tide of the air battle, but it certainly could have caused grave difficulties for the Allied air commanders. At the same time, the *Luftwaffe* commanders, feeling the mounting pressure from American day fighters, ordered their own fighter

forces to withdraw from forward positions into their inner defense zone and to concentrate their efforts entirely on stopping the bomber forces, ignoring the fighter escorts. This was a grievous misapplication of the principle of concentration. The proper strategy should have been to echelon part, at least, of the German fighter forces forward, with instructions to attack Eighth Air Force's escort fighters as far forward as possible, forcing them to drop their auxiliary tanks early in their missions and limiting thereby their combat radius. This done, the German fighters could have concentrated later on the heavy bombers. Instead, the *Luftwaffe* command let the fighters go, unmolested, to extreme range, hoping that there was a limit. After the P-51 appeared, in March and April 1944, there was no limit. No part of Germany was exempt. And the American fighters were free to devote their best efforts to offensive sweeps against *Luftwaffe* fighters rather than to protection of "the heavies."

Under this unrelenting pressure, the German Air Force cracked up. Its combat losses from December 1943 through March 1944, according to General Adolf Galland, Inspector General of German Fighter Forces, amounted to about a thousand fighters. Wastage on training and ferrying missions during the same period, he estimates, at about the same. After three or four days' continuous action, the German fighter *staffeln* were wiped out completely, and had to be withdrawn to be reconstituted.[32] The effects on pilot quality were equally serious. During early 1944, for the first time, VIII Fighter Command pilots began to be aware of wide differences in the skill and daring of *Luftwaffe* pilots; some were as good as ever; others were greenhorns and the numbers of the latter continually increased. In such fashion, does defeat in the air feed on itself. Finally, the effects on German pilot morale were disastrous. They are summed up

in the diary of one German fighter pilot, a squadron commander, who participated in the 1944 air battles:[33]

> How much longer can it all continue? Once again Division Control reports those blasted concentrations in sector "Dora-Dora." Concentrations in sector "Dora-Dora"! This report has now come to have a different significance for us; it is a reminder that for the moment we are still alive. . . . Every day seems an eternity. There is nothing now—only our operations, which are hell, and then more waiting—that nerve-wracking waiting for the blow which inevitably must fall, sooner or later. Everytime I close the canopy before taking off, I feel that I am closing the lid of my own coffin.

Thus, slowly, inexorably, command of the air passed into the hands of the Allies. By April, the Luftwaffe was defeated. By June, it was impotent, as its performance at the time of the invasion of Normandy attests. And on the occasion of the climactic German counterattack against the Allied armies in Normandy, at Mortain in early August, not a single *Luftwaffe* aircraft put in an appearance to assist the attacking German panzer divisions. Normandy, indeed, was as much an air force as a ground force victory. The scope of Allied air superiority in that decisive campaign was nowhere more clearly shown than during the great sweep of General George Patton's Third U.S. Army from Britanny to the borders of Germany during August 1944. On that drive, flank cover for Patton's Army against the German Nineteenth Army south of the Loire was provided by P-47s of IX Fighter Command. The German Air Force had been swept from the skies.

With this, the objectives of Operation POINTBLANK, so nearly forfeit in the winter of 1943, were gained in

a period of two or three months in early 1944 and held thereafter. We should note, however, that in gaining those objectives, American air commanders had had their original expectations reversed on almost every point. The results aimed at—air superiority—had been achieved but not at all by the means and methods originally envisaged. It was a victory of improvization, and even of luck, as the case of the P-51 shows, as much as, perhaps more than, a victory of prevision and planning. Like their RAF colleagues, whose experience paralleled their own in so many ways, the American Air Force commanders had clearly seen the importance of air power in the years before the war, years during which its promise was hidden from most military men. They had seen, too, that air forces, if they were to achieve their maximum effect, must be commanded independently. Both of these facts are very much to their credit.

But beyond these points, which are in all truth important enough, it cannot be said that American air commanders saw at all clearly the character that air war would assume or that they weighed at all accurately what its demands would be. In particular, they failed completely to grasp the essential meaning of air superiority. This is not surprising; the second World War, after all, is the first, and so far the only, experience we have had of large-scale air war. During the 1920's and the 1930's, all that they had to go on was hunches and guesses. In such a pioneering venture, error is unavoidable. And if American airmen made mistakes, certainly they made fewer than did the airmen of any other nation. Making all due allowance for the difficulties and the genuine accomplishments of our air strategists, it should, nevertheless, be perfectly clear that every salient belief of prewar American air doctrine was either overthrown or drastically modified by the experience of war. Germany proved not at all vulnerable to strategic bomb-

ing. As our bombing attacks grew, so did German production. Her total armament production rose over 300% between January 1942 and July 1944. As late as November 1944, by which time the strategic bombing attacks had reached formidable proportions, it still stood at 260% of January 1942 levels. Postwar estimates by the United States Strategic Bombing Survey, much controverted, suggest that all the bombing did was to slow down this impressive rise of German armament production by 15 to 20%. Similarly with German aircraft production. It doubled in 1943. It doubled again in the first half of 1944. Bombing may have contributed to slowing down that formidable rate of increase by, again, a factor of 15 to 20%.

The lesson is clear. VIII and XV Bomber Commands did not destroy the German Air Force by bombing it; it came nearer destroying them. Indeed, the German Air Force was never truly destroyed. It was defeated in battle, partly by the heavy bomber missions which forced it, as the RAF in 1940 had not been forced, to defend its homeland, partly by the American day fighters who struck not only at its materiel, as the bombers did, but at other factors no less important in an air force—its leadership, its veteran pilots, its command structure, its morale, its hopes. This, of course, represented a return to an indirect strategy, or, to use the current argot, a "counter-force" strategy: the classic military strategy of challenging and defeating the enemy armed forces by wager of battle. Despite the visions of its protagonists of prewar days, the air war during the second World War, no less than the fighting on the ground and at sea, was attrition war. It did not supplant the operations of conventional forces; it complemented them. Victory went to the air forces with the greatest depth, the greatest balance, the greatest flexibility in employment. The result was an air strategy completely unforeseen by air commanders,

different in its *methods* but not different in its *objects* from traditional strategy.

Since 1945, obviously, changes in weaponry have greatly diminished the importance of any practical lessons we might draw from our World War II experience. I might add, however, that I, for one, am not convinced that such changes have *nullified* those lessons. That depends entirely upon circumstances, which are in the nature of things unpredictable; the "impossible" is always happening, as we have just seen. But one lesson of Operation POINTBLANK has not been overshadowed by what has happened since. All military history shows the dangers of confusing doctrine with dogma. When one does, one is too likely to put all the eggs in one basket. The Air Force, with its heavy bomber dogma, came perilously close to doing just that in 1943. It was saved from paying the price for that mistake by a mixture of luck, of improvization, and of strategic blunders by the enemy—but only by fairly narrow margins. It need hardly be pointed out that if ever again the Air Force were to find itself in such circumstances, the consequences could be fatal. That, I think, is the great lesson of Operation POINTBLANK. It is a lesson which I hope you will always carry with you through your future careers in the Air Force.

Footnotes

1. The United States Strategic Bombing Survey, *The German Anti-Friction Bearings Industry*, pp. 4-6.

2. *Ibid.*, pp. 122-123.

3. *Ibid.*, pp. 54-55. After the war the Strategic Bombing Survey estimated that the 14 October raid destroyed or damaged only about 10% of the machine tools in the Schweinfurt plants and rendered unusable about 20% of finished stocks: USSBS, *Over-all Report (European War)*, p. 26.

4. Martin Caidin, *Black Thursday* (New York, 1960), p. 280.

5. *Ibid.*, p. 383.

6. USSBS, *Aircraft Division Industry Report*, Exhibit III-D.

7. Wesley F. Craven and James L. Cate, eds., *The Army Air Forces in World War II* (Chicago, 1951), III, 58, 190-195.

8. *Ibid.*, 63.

9. Sir Charles Webster and Noble Frankland, *The Strategic Air Offensive against Germany, 1939-1945* (London, 1961), II, 280-281; III, 131.

10. For United States air doctrine between the wars see Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm, 1917-1941* (USAF Historical Studies: No. 89, RSI, Air University, 1955). For the development of RAF strategic doctrine, which paralleled American doctrine but seemingly had little

influence on it, see Webster and Frankland, *op. cit.*, I, part i.

11. Greer, *op. cit.*, pp. 57-58, 80-81.

12. Webster and Frankland, *op. cit.*, IV, 72-73.

13. Claire L. Chennault, *Way of a Fighter* (New York, 1949) p. 26. Chennault's criticisms of two of these tests are to be found in an ACTS paper on Pursuit Aviation, dated September 1933 (USAFHD 4778-6) and a paper on the 1935 maneuvers drawn up for the Chief of the Air Corps (USAFHD 4686-35).

14. Greer, *op. cit.*, p. 56.

15. USAFHD 167. 5-2.

16. USAFHD 168. 79-50.

17. Boylan, *The Development of the Long-Range Fighter* (RSI: Air University, AHS 136), pp. 35-36.

18. USAFHD 168. 12-9. It is interesting to note that this Board examined and reported upon no less than eighteen fighters then in development by the AAF. Seemingly the only AAF fighter they did not examine was the one which was later to solve the problem, the P-51 Mustang, then entering production on a British contract with the North American Aviation Company of California.

19. Webster and Frankland, *op. cit.*, I, 239.

20. USAFHD 168. 12-9.

21. USAFHD 168. 491 (Operational Letters), Vol. I, 21 July 1943.

22. Boylan, *op. cit.*, p. 68.

23. *Ibid.*, p. 86.

24. Craven and Cate, *The Army Air Forces in World War II*, II, 711. Gen. Eaker revised this opinion within the week in a following dispatch.

25. USAFHD 520. 310J, pp. 18-19.

26. For the history of the YB-40, see Craven and Cate, *op. cit.*, II, 680; VI, 217-218, 268.

27. USAFHD 202. 2-11.

28. VIII Fighter Command History of Range Extension for Fighters, USAFHD 524. 01.

29. Craven and Cate, *op. cit.*, VI, 219.

30. Boylan, *op. cit.*, p. 152.

31. USAFHD 525. 548 (12 January 1944).

32. Adolf Galland, *The First and the Last* (New York, 1953), pp. 250, 256-257.

33. Heinz Knoke, *I Flew for the Führer: the Story of a German Fighter Pilot* (New York, 1954), pp. 161-162, 188-189.

EIGHTH AIR FORCE, COMBAT AVAILABILITIES
MARCH TO DECEMBER 1943

EIGHTH AIR FORCE BUILD-UP OPERATIONAL GROUPS	H. B. GROUPS	FIGHTER GROUPS
31 MAR 43	6	1
30 APR 43	6	3
31 MAY 43	12	3
30 JUN 43	13	3
30 SEP 43	20 +	6
31 OCT 43	20 +	6
30 NOV 43	21 +	7
31 DEC 43	25 +	10

HEAVY BOMBER AVAILABILITY
DAILY AVERAGE BY MONTH, 1943

	HEAVY BOMBERS			CREWS		EFFECTIVE COMBAT STRENGTH	DAILY AVERAGE DISPATCHED ON MISSION
	IN THEATER	IN TAC. UNITS	FULLY OPNL IN TAC. UNITS	ASSIGNED	AVAILABLE		
MAR		190	112	151	87	87	
APR		231	153	187	140	140	
MAY		340	200	318	178	178	
JUN		459	287	419	222	222	
JUL	800		378		315	279	283
AUG	761		406		341	291	283
SEP	881		461		409	373	323
OCT		763	535	479	417		

Air Force, USAFA/3.25

NOV		502			
DEC	1036	1057	752	949	723